



Drivers for Participation in Car-Sharing Communities

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Abstract

Considering the urgency of the environmental crisis, sustainability transitions are more important now than ever. The transport sector contributes substantially to the environmental crisis, requiring a broad adoption of sustainable alternatives. Sustainable developments in the transport sector include, amongst others, car-sharing. This study investigates drivers for participation in community car-sharing, a special scheme of carsharing in which a car is shared only among a fixed group of people. We test an overarching framework of drivers for participation in car-sharing communities, including environmental, communal, and financial motives as well as perceived behavioural control and prior community involvement. We conducted a cross-sectional study amongst 299 Dutch people. Our findings indicate that the environmental benefits and the involvement with the community motivate participation in car-sharing communities. However, expected financial benefits through community car-sharing do not drive the intention to share a car with one's community, indicating that financial appeals are ineffective in this context. Moreover, we found that the more people feel that they can easily share a car with their neighbours, the stronger their intention to participate in community car-sharing. While prior community involvement does not directly influence participation in car-sharing communities, it slightly contributes to higher perceived behavioural control, thereby contributing to higher intentions to share a car with the community indirectly. Highlighting environmental and communal aspects of car-sharing communities and making community car-sharing feel easy and doable can help motivate more people to join car-sharing communities, making transportation more sustainable.

Keywords: car-sharing, community, motives, perceived behavioural, control, pro-environmental behaviour

Drivers for Participation in Car-Sharing Communities

To meet climate targets and thereby limit climate change, emissions have to be reduced drastically in the coming years. This requires a wholistic change in all systems, and efforts from multiple sectors need to be combined to limit global warming as much as possible (IPCC, 2018). One sector that substantially contributes to climate change is the transport sector, accounting for 15% of greenhouse gas emissions, and for 23% of energy-related CO₂ emissions. The majority of these emissions stem from road vehicles, accounting for 70% of transport-related CO₂ emissions (IPCC, 2022). Targeting the transport sector to reduce emissions is, thus, inevitable in the efforts to mitigate climate change. In particular, road vehicle emissions provide the opportunity for significant emission reductions.

There are several ways to tackle emission reduction in road transportation. First, transitioning from combustion vehicles to electric vehicles can help to decrease emissions. Especially if electric vehicles are charged with energy from renewable sources or low-carbon energy sources, the lifetime emissions of electric cars are substantially lower than those of combustion cars (IPCC, 2022; Wu et al., 2018). Another option to decrease the negative environmental impact of road transportation is through shared vehicles (IPCC, 2022). Car-sharing is associated with fewer emissions than individual car ownership, making it a more sustainable alternative to private car use (Martin & Shaheen, 2011; Nijland & van Meerkerk, 2017). The emission reduction from car-sharing compared to car ownership is explained mainly in two ways. First, people drive less when they engage in car-sharing. Second, car-sharing reduces the need to own a car so that, consequently, users of car-sharing get rid of their cars and do not buy a new one (Martin & Shaheen, 2011). In view of the positive consequences of electric vehicles and car-sharing on the environment, the highest impact is expected when both are combined so that electric cars are used in car-sharing models.

Considering the benefits of car-sharing for the environment and the need to shift to sustainable transportation systems, car-sharing needs to be expanded. In recent years, car-sharing is trending, and numerous different car-sharing options exist (Mindur et al., 2018). Nevertheless, a lot of people in the Netherlands still own their private car (Kennisinstituut voor Mobiliteitsbeleid, 2022). Thus, there is a need to stimulate people to adopt more pro-environmentally friendly means of transport like car-sharing.

The Role of Communities in Car-Sharing

Communities are a possible way in which pro-environmental behaviour like car-sharing can be stimulated. This is because communities have an influence on the individual behaviour of community members (Jans, 2021; Sloot, 2021). Members of a pro-environmental group incorporate their group membership into their social identity (Jans, 2021). Social identity theory (Tajfel & Turner, 1979) proposes that people's self-concept depends on one's social identity, which is formed from the knowledge about one's group membership and one's emotional attachment to groups. When being part of a pro-environmental community, people incorporate being a pro-environmental person into their identity and strive to behave in line with the group goals (Steg & de Groot, 2019). The norms of a group, in this case pro-environmental norms, influence the group members attitudes and guide their behaviour (Fielding & Hornsey, 2016). Communities can even motivate pro-environmental behaviour on top of personal motivation, so communities offer additional pro-environmental motivation (Sloot, 2021). Thus, community initiatives are an effective means to promote pro-environmental behaviour (Jans, 2021; Sloot, 2021). Considering the benefits of pro-environmental communities, the current study focuses on community car-sharing.

Community Car-Sharing

In community car-sharing, a fixed group of people like neighbours, friends, or family is sharing a car. The concept is based on the idea that a community of ten to twenty people

share, depending on the group size, one or two cars (e.g., Auto van de Straat initiative, Stichting Natuur & Milieu, n.d.). Additionally, the use of the car is organized by community members themselves, for example via an app in which community members can reserve the car. The car can either be rented out by one of the community members or it can be provided by a company, which then also maintains the car. Every member of the car-sharing community pays only for the time and kilometres they drive. Consequently, the key difference between community car-sharing and other car-sharing schemes is that the car is only shared amongst a certain group of people. Being a special form of car-sharing incorporating communal aspects, car-sharing communities are a potentially highly effective way to reduce emissions from the transport sector. Therefore, it is of interest to know what influences participation in car-sharing communities.

Influences on the Participation in Pro-Environmental Communities

Starting with influences on the participation in pro-environmental communities in general, such determinants been investigated within the context of energy communities¹ (Sloot, 2021). In his study, Sloot (2021) introduced and tested a motivational framework for community participation. First, it was shown that environmental motives influence participation, meaning that joining pro-environmental communities is motivated by the urge to do something good for the environment. Secondly, communal motives play a role in people's decisions to participate in pro-environmental communities. In other words, being engaged with other community members makes pro-environmental communities attractive and drives people to participate. The influence that financial motives have on pro-environmental community participation has been investigated as well, yielding mixed results. While, when asked directly, people indicated that saving money influences their decision to join an energy community, financial motives did not influence actual participation. Hence,

¹ Energy communities are local communal initiatives with the goal to promote transition towards sustainable energy behaviour

participation in pro-environmental communities is driven by different factors, but predominantly by environmental and communal motives.

Based on the motivational framework tested in energy communities, the present study aims to extend this model and test it in the context of a car-sharing community. To increase engagement in community car-sharing and motivate people to join such sharing communities, it is important to know the drivers of community car-sharing. Understanding which factors drive participation in car-sharing communities, then, allows for taking effective measures to promote community car-sharing. So far, examining drivers for participation in car-sharing communities has not been subject to research. In line with the findings concerning membership in pro-environmental communities, we focus on people's evaluation of financial motives, environmental motives, and communal motives as key predictors of the intention to participate in a car-sharing community. Additionally, we innovatively investigate the influence of perceived behavioural control and prior community involvement on the intention to participate in a car-sharing community. Before testing these interrelations, though, the main constructs of the study merit some closer inspection.

What are Motives for Participation in Car-Sharing Communities?

Environmental Motives. Similar to drivers for energy communities, environmental aspects of community car-sharing might guide participation in car-sharing communities. Sharing a car has environmental benefits, which might give people a reason to join car-sharing communities. *Environmental motives*, referring to the motivation to participate in a pro-environmental project to preserve the environment, were found to drive people to participate in energy communities (Sloot, 2021). Moreover, environmental motives influence car use (Ramos et al., 2020; Noppers et al., 2014). The negative influence on the environment motivates people to use their cars less (Ramos et al., 2020) or to switch to an electric car (Noppers et al., 2014). Doing something good for the environment might, consequently, also

motivate people to participate in a car-sharing community, since car-sharing communities come along with environmental benefits. Therefore, the influence of environmental motives is investigated in the present study.

Communal Motives. Additionally, community car-sharing offers the opportunity to be involved with the neighbourhood or community. The need to belong to a community directs people towards communities and drives participation in social groups (Baumeister & Leary, 1995). Another reason to join community car-sharing could therefore be the wish to be part of a community. *Communal motives* describe the desire to be engaged with the community and to build social relationships with others. Based on the findings from energy communities, where communal motives were a strong force driving people to participate in the community initiative (Sloot, 2021), they might also drive participation in other pro-environmental communities. We, therefore, investigate whether communal motives influence people's intention to participate in a car-sharing community.

Financial Motives. The expected financial benefits associated with the membership are another factor that presumably drives people to join a car-sharing community. Such anticipated financial benefits that drive behaviour are termed *financial motives* (Sloot, 2021). Pro-environmental options can have financial benefits over less environmentally friendly options. Car-sharing for instance, can often be cheaper than private car use (milieu centraal, n.d.). Consequently, saving money can lead people to behave pro-environmentally (Gifford & Nilsson, 2014). Financial motives have been found to influence car-sharing behaviour previously (Mattia et al., 2019). More specifically, economic benefits reinforce people's positive attitudes towards car-sharing, leading to a higher intention to engage in car-sharing more often in the future. Moreover, when asked directly about reasons for participation in energy communities, people rated financial motives as an important factor influencing their

involvement in a pro-environmental initiative (Sloot, 2021). On this basis, we aim to test whether financial benefits motivate participation in car-sharing communities.

The Role of Perceived Behavioural Control and Prior Community Involvement for Participation in Car-sharing Communities

Perceived Behavioural Control. While motives to join a pro-environmental community are important, it is also important to feel that participation is easily possible. Often, the car is the most convenient option to travel, and, considering that most infrastructure is concentrated on cars, for some trips it is necessary to drive by car (Steg, 2007). How easily someone can do without their own car depends on external circumstances but also psychological factors (Steg, 2007). Therefore, *perceived behavioural control* might be an additional factor influencing pro-environmental community membership in the context of car use.

Perceived behavioural control has indeed been found to predict the intention to make use of car-sharing (Akande et al., 2020; Mattia et al., 2019). The more people perceive themselves as able to share, the higher the intention to engage in sharing economies (Akande et al., 2020; Mattia et al., 2019). Generally, perceived behavioural control is associated with a range of pro-environmental transport behaviours such as using the bus or bicycle, and car use intentions (Eriksson & Forward, 2011; Setiawan et al., 2015). The feeling of being able to easily engage in pro-environmental behaviour is, thus, very important for subsequent pro-environmental action. In line with these findings, perceived behavioural control was found to predict the intention to participate in a climate action community (Bamberg et al., 2015). We, therefore, test whether perceived behavioural control also influences people's intention to participate in car-sharing communities.

Prior Community Involvement. A community in a sharing context, such as a car-sharing community, differs in multiple aspects from non-sharing initiatives like energy

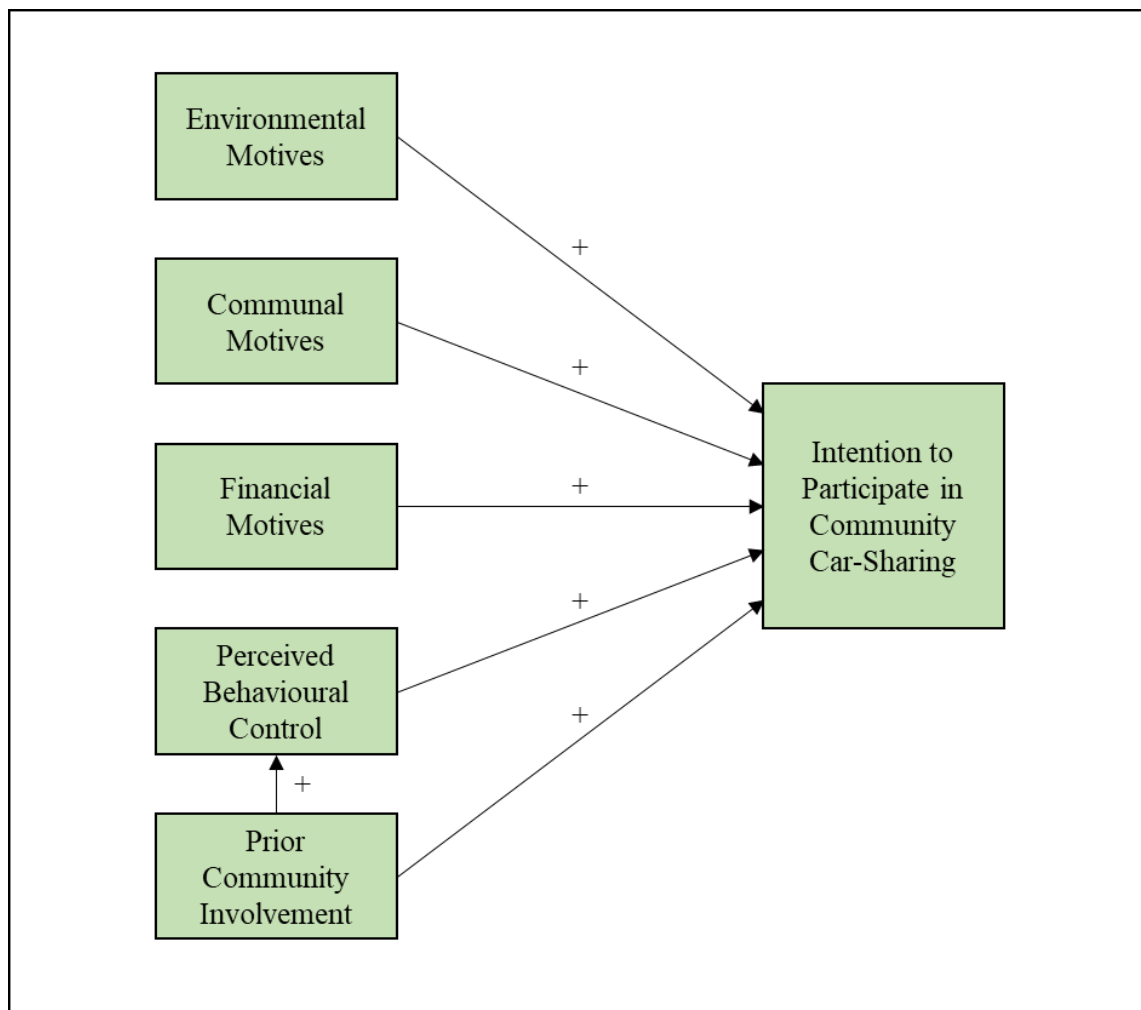
communities. For example, in sharing communities one is dependent on others and does not have full control over resources. Moreover, a car-sharing community revolves around cooperation with other community members and, naturally, makes the community a fundamental aspect of this car-sharing scheme. Hence, how close and connected a community is already before they share a car might influence the motivation for community car-sharing. In a community in which members are already very involved prior to community car-sharing, people might be more willing to share a car.

Prior community involvement in this context refers to the level of community identification and the amount of interpersonal contact amongst community members (see Sloot, 2021). Research on energy communities indeed revealed that if people have more contact with other community members and identify stronger with their community, they are more willing to participate in an energy community (Sloot, 2021). Prior community involvement might be particularly important in a sharing context since successful management of shared cars requires community members to be involved and in contact to organize themselves.

Prior community involvement presumably influences the intention to participate in a car-sharing community directly but might also increase the perceived ability to successfully share a car with fellow community members. People who are already engaging with fellow community members prior to sharing a car might already know what to expect from their community. Since unfamiliarity with fellow car-users has been identified as a barrier to car-sharing (see Nansubuga & Kowalkowski, 2021), prior community involvement might reduce this barrier and instead increase the perceived ability to participate in a car-sharing community. Therefore, prior community involvement is expected to influence the intention to join a sharing initiative both directly but also indirectly via perceived behavioural control.

The Current Study

To summarize, this study aims to investigate the influence of psychological factors on the intention to participate in a pro-environmental sharing community. By extending a model tested in energy communities, we innovatively test a comprehensive framework predicting the intention to participate in a car-sharing community. We hypothesize that (H1) stronger environmental motives relate to a higher intention to participate in a car-sharing community, (H2) stronger communal motives relate to a higher intention to participate in a car-sharing community, and (H3) stronger financial motives relate to a higher intention to participate in a car-sharing community. Moreover, we expect that (H4) higher perceived behavioural control relates to a higher intention to participate in a car-sharing community, and (H5) the prior level of involvement with one's community relates positively to the intention to participate in a car-sharing community. Lastly, we expect a mediation effect: (H6) the effect of prior community involvement on the intention to participate in a car-sharing community is mediated by perceived behavioural control.

Figure 1*Conceptual Model*

Note. The hypothesized relationships between the predictor variables and the intention to participate in a carsharing initiative are depicted in the conceptual model.

Method

Procedure and Participants

We conducted a cross-sectional online study, surveying individuals living in the Netherlands. Participants were recruited via social media, newsletters, and e-mails. We sampled in collaboration with a non-governmental organization, several municipalities in the Netherlands, and mobility organizations, which shared the survey on social media and in a

newsletter. Additionally, we distributed the survey amongst neighbourhood communities via e-mail.

The online questionnaire was constructed in Qualtrics and included measures for the constructs of interest (i.e., environmental motives, communal motives, financial motives, perceived behavioural control, prior community involvement, and intention to participate in a car-sharing community) as well as additional measures that are not part of the analyses of this paper. After opening the link, participants were informed about the purpose of the research and asked to give informed consent. The first part of the survey consisted of the items assessing prior community involvement. Then, a short video was displayed, in which community car-sharing was explained. The video had a duration of two minutes and was available in English with Dutch subtitles. The purpose of the video was to make sure that all participants understood the core concept of the study, namely community-carsharing. The video started by explaining what community car-sharing is. It was conceptualized as a car-sharing scheme where one or two cars are shared by a fixed group of people living close together, like neighbours. Further, it was explained how community car-sharing can be organized and what it implies for the practice of sharing. After watching the video, participants continued filling in the questionnaire including the items that assessed the constructs of interest and demographic data. No incentives were provided to participants and the participation was voluntary. The survey was available in either English or Dutch. In total, the completion of the questionnaire was estimated to take around ten to fifteen minutes.

The required minimum sample size for the regression model was determined via a power analysis with the program G*power (Faul et al., 2009). To find medium effect sizes (see Funder & Ozer, 2019; estimates based on Sloot, 2021 and Akande et al., 2020) for the direct effects of the predictor variables on the intention to participate in a car-sharing community, 33 participants were required (see Appendix A). To detect a small mediation

effect, a minimum sample size of 352 participants needs to be included to achieve a power of .8 (calculations based on Fritz & MacKinnon, 2007, see Appendix A).

In total, 396 responses were initially collected, whereof 299 responses were valid for further analyses. Some participants had to be excluded from the analyses because they did not fill in large parts of the questionnaire ($n = 93$), or they did not consent to participate ($n = 4$)². The remaining sample included 49.8% ($n = 149$) male participants, 48.8% ($n = 146$) identify as female and 1.5% ($n = 4$) preferred not to indicate their gender. Participants were between 21 and 81 years old with a mean age of 51.83 years ($SD = 13.60$, $n = 291$). Most participants lived with a partner or family. The participants' households owned between two and three cars ($M = 2.28$, $SD = 0.79$, $n = 299$) and approximately two people per household were driving ($M = 1.92$, $SD = 0.79$, $n = 298$). Participants drove between 0 and 59 hours per week, with an average of 6.3 hours a week ($SD = 7.82$, $n = 287$) and covered distances between 0 and 1500km weekly ($M = 204.04$, $SD = 213.73$, $n = 298$). Most of the participants, namely 44.1%, live in urban areas ($n = 132$), 20.1% reported living in suburban areas ($n = 60$) and 35.5% of the participants were from rural areas ($n = 106$). For a majority of the participants, free parking possibilities were available in their street and 58.9% reported having a driveway where they can park their car. Around 15% of the participants already made use of car-sharing services.

Measures

Environmental, Communal, and Financial Motives

Direct measures of motives such as asking people openly about the causes of their behaviour tend to be less accurate in predicting behaviour than indirect measures. However,

² We decided to not exclude participants based on the time they had spent watching the video. Based on the time people spend on the slide of the questionnaire with the video on it, it seemed as if some people had not watched the video. However, we decided to keep their data, since we could not test whether they had indeed not watched the video or if there were other reasons for the short time spent on the video. Moreover, another possibility is that they already knew what community car-sharing was and therefore skipped the video.

indirect measures based on the evaluation of attributes are more accurate (Noppers et al., 2016). Therefore, for the purpose of this study, an indirect measure based on the evaluation of environmental, communal, and financial attributes of car-sharing communities was used to predict what drives people to participate in community car-sharing. The items were adapted from Noppers and colleagues (2016) and from Sloot (2021). A list of all items can be found in Appendix B. Three items measuring environmental attributes ($\alpha = .85$, $M = 5.08$, $SD = 1.43$, $n = 297$) were used, including for example “community car-sharing is environmentally friendly”. Moreover, three items assessed communal attributes of community car-sharing (e.g., “community car-sharing strengthens the relationship with others who are part of the community”; $\alpha = .86$, $M = 4.44$, $SD = 1.32$, $n = 299$). Another two items assessed the evaluation of financial attributes (e.g., “community car-sharing is cheap to use”, $\alpha = .78$, $M = 4.66$, $SD = 1.40$, $n = 299$). All items were assessed on 7-point Likert scales from 1=*strongly disagree* to 7=*strongly agree* and combined to scales respectively.

Perceived Behavioural Control

Perceived behavioural control was assessed with three items (e.g., if I wanted to, I could participate in a car-sharing community) adapted from Masud and colleagues (2016). The items were measured on a 7-point Likert scale from 1=*strongly disagree* to 7=*strongly agree*. Due to low scale reliability of $\alpha = .590$, the item “whether or not I participate in a car-sharing community is beyond my control” had to be removed, leading to acceptable scale reliability of $\alpha = .88$ ($M = 4.12$, $SD = 1.92$, $n = 299$).

Prior Community Involvement

Prior community involvement was measured with a combination of eight items ($\alpha = .84$, $M = 4.59$, $SD = 0.97$, $n = 299$) that were adapted from Sloot (2021). Four of these items assessed *contact* with the community (e.g., “how often do your neighbours visit you at your home?”) measured on a 5-point scale from 1=*never* to 5=*a couple of times per week*. The

other four items captured *community identification* (e.g., “being a resident of my neighbourhood is an important part of how I see myself”) on a 7-point scale from *1=strongly disagree* to *7=strongly agree*. Because of the differing response scales, the contact items were recoded into values from one to seven to fit the corresponding scale before combining all eight items.

Intention to Participate in Community Car-Sharing

The intention to participate in community car-sharing was also assessed using three items on a 7-point Likert scale from *1=strongly disagree* to *7=strongly agree*. The additional option *not applicable* was included for participants who already participate in car-sharing communities ($\alpha = .87$, $M = 3.04$, $SD = 1.61$, $n = 277$). Displayed items were, for instance, the item “I plan to participate in a car-sharing community in the future”. All items assessing the intention to participate in a car-sharing community were created for the purpose of this study.

Results

Preliminary Analysis

The regression model was tested using a linear regression analysis in IBM SPSS Statistics version 28. The data met all assumptions for the analysis. A normal distribution of residuals was ensured and the relationship between the independent variables and the dependent variable was linear. Moreover, the assumption of homoscedasticity was met (see Appendix C), meaning that the variance of residuals was constant, and multicollinearity was ruled out ($VIF < 10$; tolerance scores > 0.2 , Pearson correlation $r < 0.8$). Thus, the statistical assumptions of the linear regression are met. Furthermore, no outliers were detected based on Cook’s distance > 1 .

A look at the bivariate correlations revealed that all predictor variables were indeed correlated with the intention to participate in community car-sharing (see Table 1). However, contrary to the assumption that perceived behavioural control mediates the relationship

between prior community involvement and the intention to join a car-sharing community, prior community involvement and perceived behavioural control were not significantly correlated.

Table 1

Bivariate Correlations Between the Variables of Interest.

Variable	Pearson Correlation				
	2	3	4	5	6
1. Intention	.49**	.51**	.43**	.66**	.13*
2. Environmental Motives	–	.57**	.53**	.42**	.00
3. Communal Motives		–	.58**	.40**	.08
4. Financial Motives			–	.43**	.13*
5. Perceived Behavioural Control				–	.11
6. Prior Community Involvement					–

Note. * $p < .05$ ** $p < .01$

Hypotheses Testing

A linear regression was conducted including environmental, communal, and financial motives as well as perceived behavioural control, and prior community involvement as determinants of the dependent variable intention to participate in community car-sharing. The model was significant ($F = 59.24$; $p < .001$) and explained 51.4% of the variance in people's intention to participate in community car-sharing ($n=276$). The findings of the regression analysis are summarized in Table 2. In line with H1, environmental motives appeared to contribute to a higher intention to participate in community car-sharing. Similarly, and in line with H2, communal motives predicted a higher intention to join a car-sharing community. However, contrary to H3, financial motives did not significantly predict the intention to join a car-sharing community. Higher perceived behavioural control was associated with a higher

intention to engage in community car-sharing, supporting H4. The hypothesis that prior community involvement predicts higher intentions to join a car-sharing community (H5) was not supported. This implied involvement with one's community not to be directly associated with people's intentions to share a car with other community members.

Table 2

The Regression Model Predicting the Intention to Participate in a Car-Sharing Community.

	Unstandardized		Standardized		<i>p</i>	<i>F</i>	adj. <i>R</i> ²
	<i>B</i>	<i>SE</i>	β	<i>t</i>			
Constant	-1.10	.42		-2.61	.009	59.24	.514
EM	.18	.06	.159	2.92	.004**		
CM	.24	.07	.195	3.45	<.001**		
FM	.01	.64	.012	.21	.833		
PBC	.43	.04	.503	10.29	<.001**		
PCI	.09	.07	.053	1.25	.214		

Note. EM = Environmental Motives, CM = Communal Motives, FM = Financial Motives, PBC = Perceived Behavioural Control, PCI = Prior Community Involvement.

* $p < .05$. ** $p < .01$.

The mediation relation (H6) was analysed by means of a mediation analysis with the R interface jamovi relying on a bias-corrected bootstrap test (the jamovi project, 2021; R Core Team, 2021). A 95% confidence interval and 5000 bootstrap samples were chosen. Thereupon we found that the total effect of prior community involvement on the intention to participate in community car-sharing was significant (see Table 3 and Figure 2). Moreover, prior community involvement had an effect on perceived behavioural control, indicating that people with higher prior community involvement to feel better able to easily participate in community car-sharing. In line with our findings of the regression analysis, the effect of

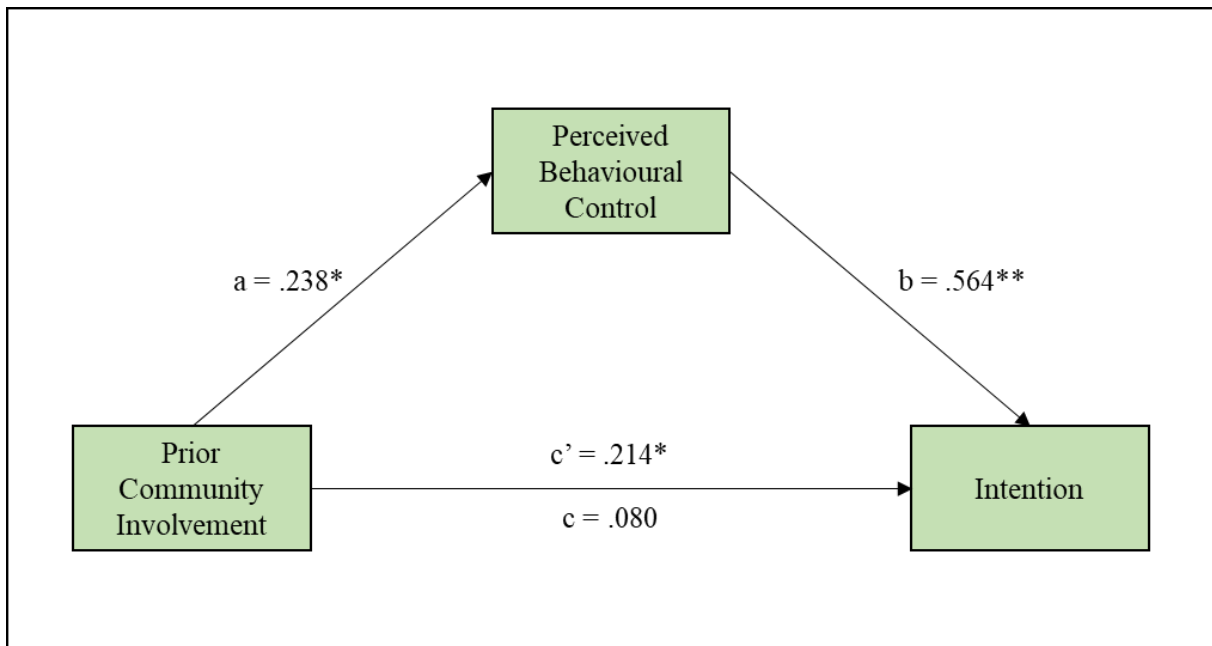
perceived behavioural control on the intention to participate in community car-sharing was significant. Moreover, we detected no significant direct effect of prior community involvement on the intention to participate in car-sharing communities, contradicting H5. However, the indirect effect of prior community involvement via perceived behavioural control on people's intention to participate was just below the significance level, indicating a small fully mediated effect. Therefore, the indirect influence of prior community involvement on the intention to participate in community car-sharing via perceived behavioural control was supported (H6).

Table 3

Mediation Estimates of Prior Community Involvement and the Mediator Perceived Behavioural Control on the Intention to Participate in a Car-Sharing Community.

	Estimate	SE	95% Confidence Interval		z	p
			Lower	Upper		
Indirect	.13	.07	.004	.260	2.01	.045*
Direct	.08	.09	-.085	.025	.94	.348
Total	.21	.10	.017	.413	2.15	.032*

Note. * $p < .05$ ** $p < .01$

Figure 2*Mediation Model*

Note. c =direct effect, c' =total effect. * $p < .05$ ** $p < .01$.

Discussion

Reducing emissions in the transport sector to mitigate the environmental crisis is a complex, yet crucial task. Sharing an (electric) car with a group of neighbours, friends, or family instead of using a private car can help the transition towards sustainability in the transport sector. To engage as many people as possible in community car-sharing, it needs to be known why people share a car with their community. On these grounds, we tested an overarching framework aiming to predict community car-sharing in the study at hand. The pro-environmental and communal nature of car-sharing communities as well as financial benefits were expected to drive participation in car-sharing communities. Moreover, we assumed that the perceived ability to easily share a car with one's community plays an important role in participation in car-sharing communities. Lastly, since community car-sharing revolves around the community, the involvement with the community before sharing a car was expected to influence whether people want to participate in community car-sharing.

Prior community involvement was anticipated to influence participation in car-sharing communities directly but also indirectly through increased perceived behavioural control. To test the assumptions, a cross-sectional study was conducted, assessing the influence of the factors above on the intention to participate in a car-sharing community in a Dutch sample.

The Environment and the Community Motivate Pro-Environmental Community

Membership

We found that environmental motives were, as expected, drivers of the intention to participate in car-sharing communities. Accordingly, our findings support the idea that participation in pro-environmental communities is driven by the desire to act pro-environmentally which has also been underpinned by previous research (Sloot, 2021). Beyond the community context, similar results have been found, for instance for the adoption of sustainable innovation and pro-environmental policy support (Noppers et al., 2016, Sharpe et al., 2021). These findings show that pro-environmental motives drive a variety of different pro-environmental behaviours. Accordingly, highlighting the environmental benefits of pro-environmental behaviour like community car-sharing and framing pro-environmental behavioural choices as benefiting the environment can motivate people to behave pro-environmentally.

As predicted, communal motives drive the intention to participate in a car-sharing community as well. In line with the assumption that the outlook on being more engaged with the community drives people to join a car-sharing community, higher communal motives were associated with a higher intention to participate in community car-sharing. In line with previous findings and validating the assumption that communities can motivate pro-environmental behaviour (Sloot et al. 2017; Sloot, 2021), we are making the case for pro-environmental communities and highlight their potential. Since members of pro-environmental communities act more pro-environmentally to adhere to the norms of the

community, pro-environmental communities fortify environmentally friendly behaviour (Steg & de Groot, 2019). The insight that membership in such communities is driven by the desire for involvement with the communities suggests that the need to be part of a community can be fulfilled in ways that motivate pro-environmental behaviour.

Expected Financial Benefits Do Not Drive Participation in a Pro-Environmental Sharing-Community

Contrary to our expectation, financial motives did not influence intentions to participate in car-sharing communities. This finding implied that people do not join car-sharing communities to save money. Previous research on financial incentives to motivate pro-environmental behaviour is partially in line with the finding that financial incentives to engage in pro-env behaviour are often not effective in the long term (Ling & Xu, 2021; Sloot, 2021; Steg et al., 2014; Steinhorst et al., 2015). Moreover, our findings are in line with research regarding motivation for car use. Instrumental motives, referring to the functional aspects of car ownership such as price, speed, and flexibility, seem to play a minor role in people's car use decisions. Even though, when asked directly, people often name instrumental functions of car use as a reason to take the car, these instrumental reasons were found to be unrelated to actual car use behaviour (Noppers et al., 2014; Steg, 2005). Similarly, whether people adopt an electric car instead of their combustion car does not seem to be influenced by how practical it is perceived to be (Noppers et al, 2014). Likewise, the intention to use car-sharing services was not motivated by cost savings in a South Korean study (Jae-Hun, 2017). Our findings, hence, corroborate previous findings about the lacking influence of financial motives on car use and indicate that car-sharing use is not motivated by financial aspects either.

A possible explanation for the missing effect of financial motives on the intention to participate in car-sharing communities is that people might not consider the financial benefits

as large enough to be worth the possible inconveniences of community car-sharing. Another possible explanation refers to people's values. People who score higher on egoistic and hedonic values might be more motivated by financial benefits (Bouman & Steg, 2019). Due to our sampling method that took place to a large part via pro-environmental organisations and neighbourhood communities, we might, however, have a sample that largely constitutes of people with predominantly high biospheric and altruistic values. These people might be more motivated by environmental and communal aspects of community car-sharing. Hence, a possible explanation with regard to the insignificant finding for financial motives might relate to people's values.

The lack of influence of financial motives on participation in car-sharing communities implies that using financial appeals is ineffective to recruit participants for community car-sharing initiatives. Therefore, we advise against the promotion of financial benefits when advertising car-sharing communities. This is not only because financial appeals are ineffective, but also because they can potentially backfire. People who are motivated to behave pro-environmentally for its own sake, as it appears to be in the present research, can lose the intrinsic pro-environmental motivation once the behaviour is rewarded financially (Grilli & Curtis, 2021). Financial rewards can promote the feeling that pro-environmental behaviour is not worth engaging in itself (Steinhorst et al., 2015). Financial incentives and framing of pro-environmental behaviour to increase financial motives can possibly reduce the environmental motives and should therefore be avoided.

Our results reproduce previous findings that financial aspects of pro-environmental initiatives are less important to people than environmental and communal aspects (Sloot, 2021; Noppers et al., 2016). Thereby, our study is in line with previous research based on self-determination theory suggesting that acting in line with one's lifestyle motivates pro-environmental behaviour (Barszcz et al., 2022; Deci & Ryan, 2012). Correspondingly,

intrinsic motivation to act pro-environmentally seems more important than external rewards like saving money with regard to motivating pro-environmental behaviour.

Perceived Behavioural Control over Community Car-Sharing Behaviour Drives

Participation in Car-Sharing Communities

Whether or not people see themselves as able to easily share a car with other community members seemed to have a strong influence on people's intention to participate in community car-sharing. Perceived behavioural control has consistently been found to predict pro-environmental behaviour, also in the transport sector (Akande et al., 2020; Eriksson & Forward, 2011; Mattia et al., 2019; Setiawan et al., 2015). Our research contributes to the body of literature on perceived behavioural control by showing that it is also relevant in a community sharing context. Moreover, the findings are relevant for practical reasons. For people to join car-sharing communities, sharing a car with the community needs to feel as easy and doable as possible. This means that (1) actual obstacles need to be reduced and the process of joining a car-sharing community and sharing a car needs to be organized as convenient and uncomplicated as possible, and (2) when promoting car-sharing communities, the focus needs to be on conveying the feeling that community car-sharing is easily doable for the target group.

Prior Community Involvement

Contrary to our hypothesis, we did not find a direct effect of prior community involvement on people's intention to participate. This contradicted previous research about the effect of community involvement on the willingness to participate in an energy community (Sloot, 2021). Contrary to Sloot's (2021) findings, community car-sharing seemed to be equally attractive for people who are already involved with their community and people who have so far not been involved a lot with their community. Correspondingly, at first sight, it seems that no strong community bond needs to be established at first to motivate

participation in car-sharing communities according to our study. Every community can potentially be motivated to participate in community car-sharing.

However, the results for the mediation model indicated a small effect of prior community involvement on the intention to participate in a car-sharing community via perceived behavioural control. Being involved in one's community, thus, can provide people with a higher feeling of being able to easily participate in a car-sharing community. Accordingly, prior community involvement apparently contributes indirectly to participation in car-sharing communities. However, as the effect was very small and the power for the analysis was lower than desired, we recommend re-testing the mediation effect with a larger sample.

Theoretical Implications

Based on previous literature from energy communities (Sloot, 2021), we proposed a new conceptual framework aiming to predict participation in pro-environmental community initiatives in a sharing context. Our findings largely support the proposed framework, apart from financial motives which failed to predict participation in pro-environmental communities. Adding perceived behavioural control gave the framework additional predictive power, highlighting that perceived behavioural control seems to complement the model well. Moreover, we innovatively tested for an indirect effect of prior community involvement via perceived behavioural control, which needs further investigation but gives a hint that community involvement might increase perceived behavioural control. Future research could test this model in other pro-environmental sharing communities to confirm the model's validity across different sharing contexts.

Limitations & Future Research

A limitation of our study refers to the understanding of the concept of community car-sharing in our sample. The concept was introduced by means of a video. However, we did not

have the means to control whether people watched the video and understood what community car-sharing is. This might have affected the results. Future studies should, therefore, retest the investigated research model, implementing a means to check the understanding of community car-sharing.

Another limitation of the present study pertains to the insufficient power for the mediation analysis. A sample size of 352 was needed to have sufficient power to detect a small effect of 0.15. However, only 277 responses were analysed in the corresponding mediation analysis. This limits the informative value of conclusions based on the mediation analysis. Future research testing the influence of prior community involvement on car-sharing participation via perceived behavioural control with a larger sample is needed.

Further research should also investigate the association between the tested predictors of community car-sharing participation and actual involvement in such a community. This allows to draw conclusions about the influence of the motives on actual participation in car-sharing communities. Moreover, the effects of the framework proposed in this study on the involvement in other sharing communities could be subject to future research. Lastly, further studies could investigate how values influence motives to participate in car-sharing communities to see whether our findings replicate when accounting for values.

Conclusion

In the present study, we tested predictors for the intention to participate in a car-sharing community. To successfully promote pro-environmental sharing communities, highlighting its benefits for the environment seems to be effective to motivate people to join community car-sharing. Similarly, community involvement motivates participation in pro-environmental sharing initiatives. Financial benefits through community car-sharing, however, turned out ineffective in promoting participation in pro-environmental sharing initiatives. Feeling able to easily share a car with the community also contributed to people's

motivation to participate in car-sharing communities, while people who are already very involved with their community might feel more able to easily share a community car.

Appealing to environmental and communal motives as well as making participation in pro-environmental sharing communities feel easy and doable presumably are successful ways to motivate people to participate in pro-environmental sharing-communities.

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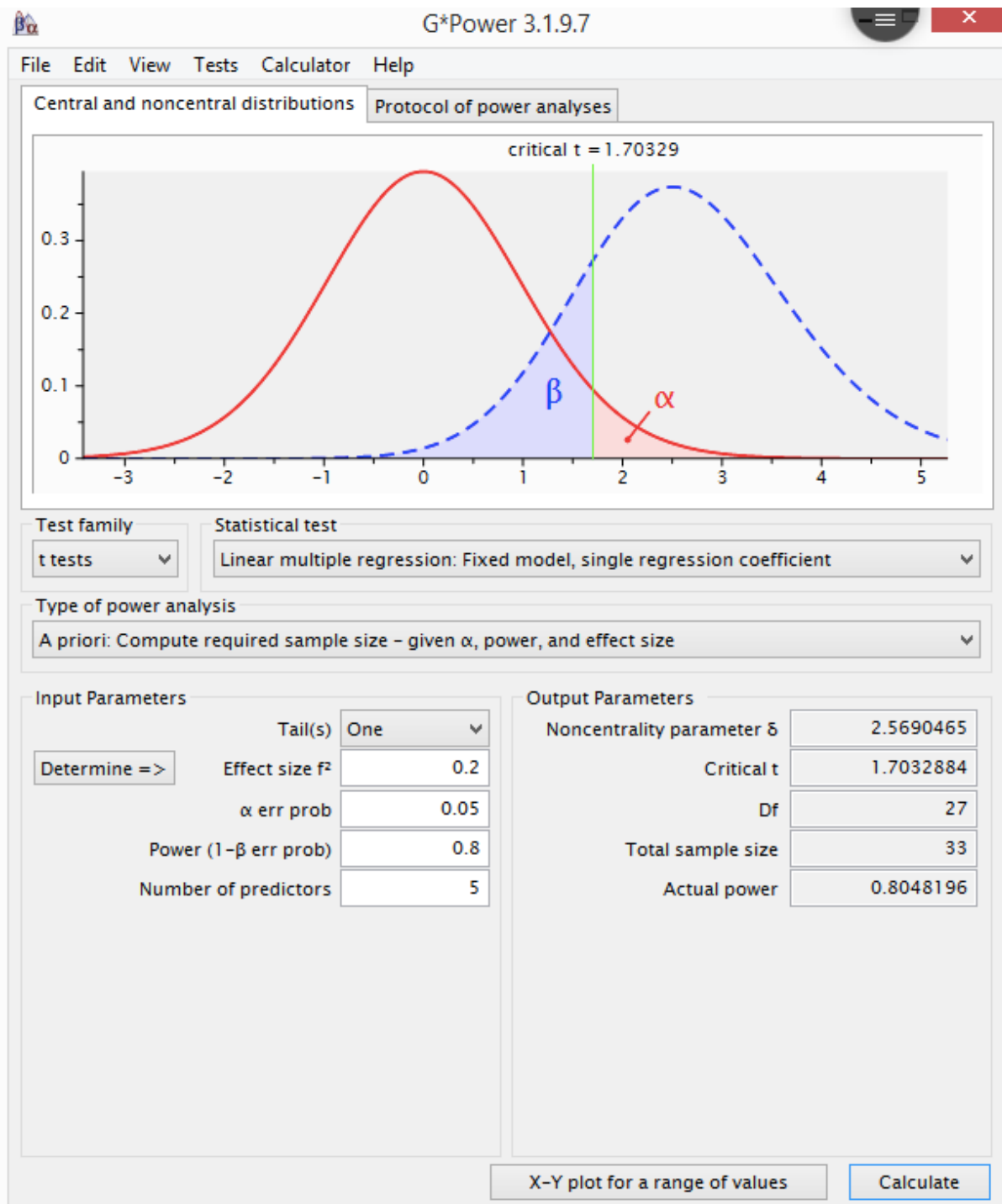
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Appendix A

Power Analysis Linear Regression



Note. The parameters entered in the a priori power analysis are depicted.

Minimum Sample Size Calculation Mediation Analysis

The require sample size for the mediation analysis was calculated based on Fritz and MacKinnon (2007). The following formula was used:

$$n = \frac{L}{f^2} + k + 1$$

n is the sample size, k denotes the number of predictors, f represents the effect size, and L is a tabled value based on a specific power value.

The following calculation was made, using an α error probability of .05 and a power of .8 (leading to $L = 7.85$) for an effect size of .15 to estimate the sample size:

$$n = \frac{7.85}{0.15^2} + 2 + 1$$

$$n = 351.89$$

Appendix B

Table A

List of items used to assess the constructs of interest

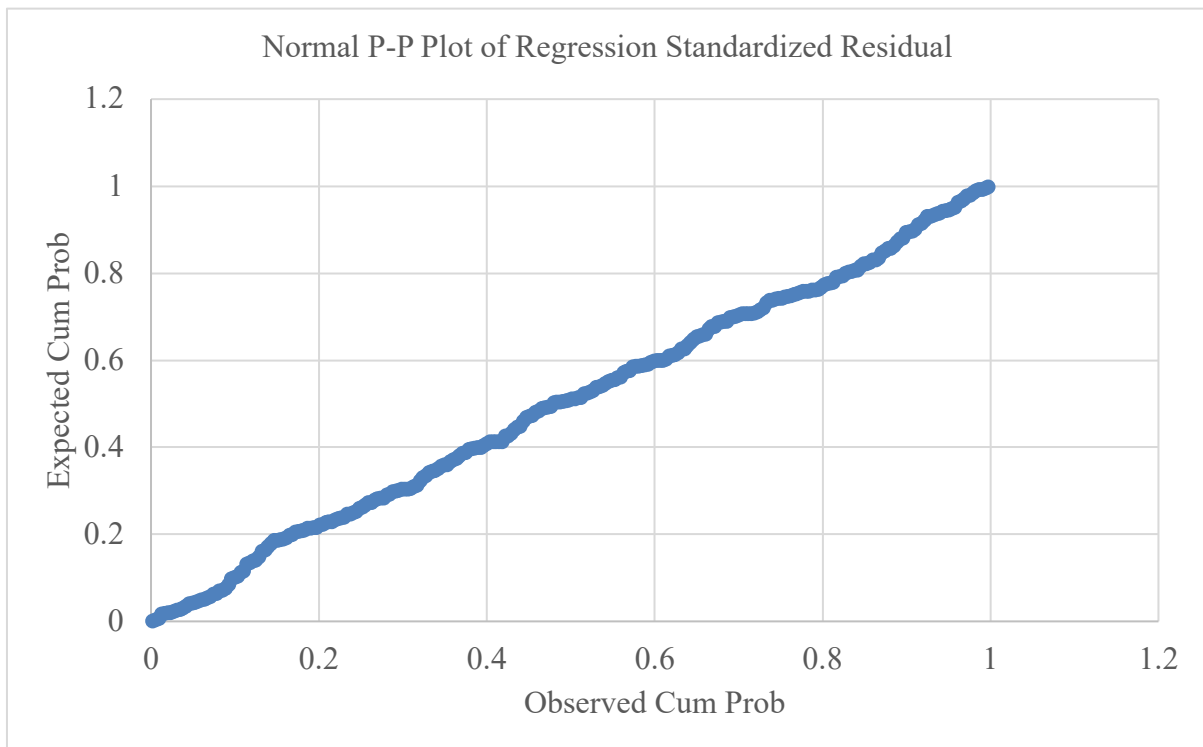
Construct and description	Scale	Items	<i>M</i>	<i>SD</i>
Environmental Motives: Community car-sharing...	From 1 <i>strongly disagree</i> to 7 <i>strongly agree</i>	...is environmentally friendly	5.18	1.61
		... reduces the amount of greenhouse gas emissions.	4.80	1.74
		...provides the opportunity to do something good for the environment.	5.29	1.53
Communal Motives: Community car-sharing...	From 1 <i>strongly disagree</i> to 7 <i>strongly agree</i>	...increases involvement with one's community.	4.54	1.47
		...allows to make new contacts with others in the community.	4.27	1.54
		...strengthens the relationship with others who are part of the car-sharing community.	4.52	1.49
Financial motives: Community car-sharing...	From 1 <i>strongly disagree</i> to 7 <i>strongly agree</i>	... makes travelling by car more affordable.	4.80	1.58
		...is cheap to use.	4.51	1.51
Perceived behavioural Control: We are interested in understanding how confident you are to participate in a car-sharing community. Please indicate to	From 1 <i>strongly disagree</i> to 7 <i>strongly agree</i>	If I wanted to, I could participate in a car-sharing community.	4.35	2.07
		Participating in a car-sharing community is easy for me.	3.89	2.01
		Whether or not I participate in a car-sharing community is beyond my control.*	4.71	1.80

what extent you agree or disagree with the following statements.				
Prior community Involvement –	From 1 <i>strongly</i>	I identify with my neighbourhood.	4.83	1.46
Identification: We would be interested	<i>disagree</i> to 7	I feel committed to my neighbourhood.	5.45	1.36
in knowing to what extent you agree or	<i>strongly agree</i>	I am glad to be a resident of my neighbourhood.	6.02	1.11
disagree with the following statements.		Being a resident of my neighbourhood is an important part of how I see myself.	4.51	1.53
Prior community involvement –	Recoded From 1	How often do your neighbours visit you at your home?	3.43	1.52
Contact: Next, we would like to know	<i>never</i> to 5 a	How often do you visit your neighbour at their home?	3.43	1.55
how often each of the events described	<i>couple of times</i>	How often do you participate in activities together with	3.23	1.34
below occurs:	<i>per week</i> to a 7-	your neighbours?		
	point scale	How often do you have contact with your neighbours?	5.8	1.27
Intention: We would like to know	From 1 <i>strongly</i>	I consider joining a car-sharing community.	3.37	1.99
whether you want to participate in a car-	<i>disagree</i> to 7	I plan to participate in a car-sharing community in the	3.68	2.00
sharing community in the future. Please	<i>strongly agree</i> ,	future.		
indicate to what extent to agree with the	with the	I plan to start a car-sharing community in the future.	2.16	1.36
following statements. If you are already	additional option			
part of a car-sharing community, please	<i>8 not applicable</i>			
choose “not applicable”.				

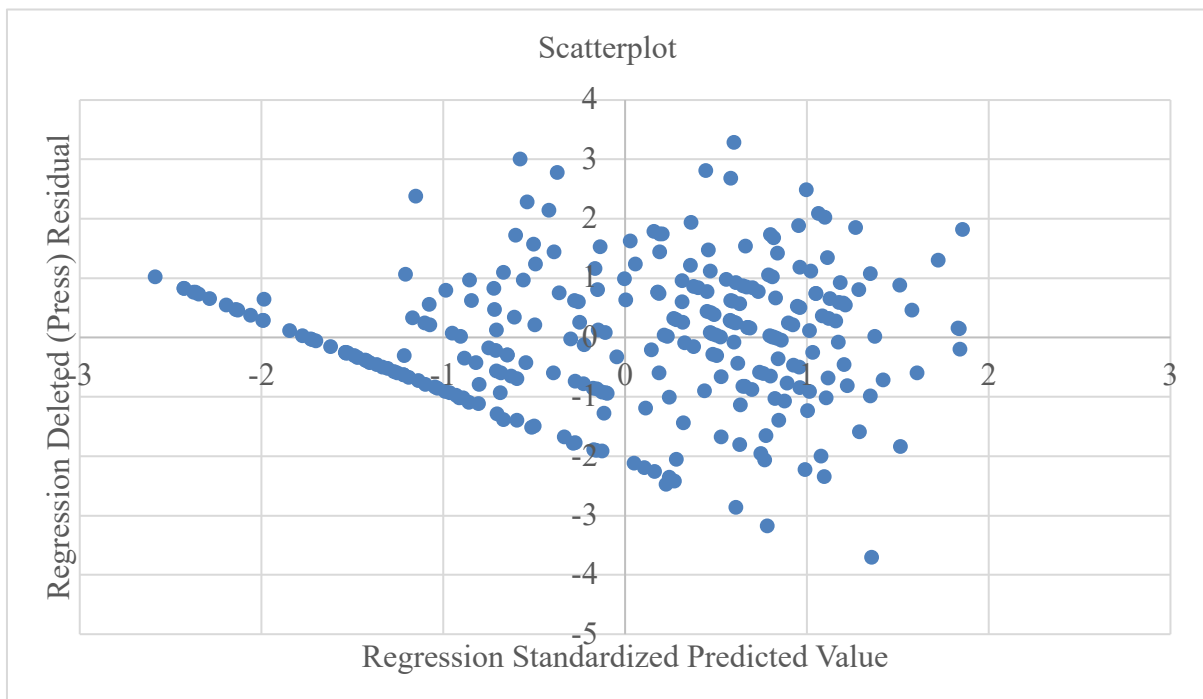
Note. * reverse-scored

Appendix C

Assumption Checks



Note. The P-P plot to test the normality assumption is displayed.



Note. The scatterplot displays the constant variance of residuals, implying that the homoscedasticity assumption is met.